GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

RN190012262

Registration No: | | | | | | | | | | |

Total Number of Pages : 2 AR-17 B.TECH

B.TECH 5th SEMESTER EXAMINATIONS, NOV/DEC 2019

BEIOE5053 PROCESS INSTRUMENTATION

BIOTECHNOLOGY

Time : 3 Hours Maximum : 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) 10 x 2=20 Mark

Q.1. Answer *All* Questions

a The device that convert energy from one form to another form is [CO1] [PO1]
a) Resistor b)sensor c) amplifier d) transducer

b Which of the statement is wrong about linearity [CO1] [PO1]
a) Maximum deviation from linear relation between input and output.
b) The output of an instrument has to be non-linearly proportionate to the measured quantity.
c) Shown in the form of full scale percentage (% fs).
d) The graph shows the output reading of an instrument when a few input readings are entered.

c The most common application of float system is [CO2] [PO2]
a) To monitor the fuel tank level in motor vehicle
b) To monitor the flow of solid
c) To monitor the flow of liquid
d) All of these

d The flow meter which is replacing the differential pressure meters in its applications is [CO2] [PO2]
a) Vortex-shedding flow meter b) Electromagnetic flow meters
c) Ultrasonic flow meters d) All of these

e Identify which of the following flowmeters inherently measures mass flow rate: [CO2] [PO1]
a) Thermal b) Magnetic d) Flow nozzle e) Venturi tube

f Starting temperature of optical radiation pyrometer is [CO3] [PO2]
a) 400 ^{o}C b) 800 ^{o}C c)1200 ^{o}C d)1600^{o}C

g Which of the following filled system expansion thermometer has the lowest positive temperature measurement capability? [CO3] [PO3]
a) Mercury in glass thermometer b) Alcohol in glass thermometer c) Fused metal (Na or K) in steel thermometer d) Nitrogen in steel thermometer

h All the thermocouples used for temperature measurement use dissimilar metal [CO4] [PO3]
a) Strips b) Bar c)Wires d)Beads

i Which of the following is the principle of Atomic Absorption Spectroscopy? [CO4] [PO3]
a) Radiation is absorbed by non-excited atoms in vapour state and are excited to higher states
b) Medium absorbs radiation and transmitted radiation is measured
c) Colour is measured
d) Colour is simply observed

j 1. Which of the following statement is false for mass spectroscopy? [CO5] [PO2]
a) Mass spectroscopy is used to identify unknown compounds within a sample, and to elucidate the structure and chemical properties of different molecules
b) Particle are characterized by their mass to charge ratios (m/z) and relative abundances
c) This technique basically studies the effect of ionizing energy on molecules
d) This technique can be used on all state of matter

PART – B: (Short Answer Questions) 10X2=20 Marks

Q.2. Answer *ALL* questions

a Why calibration of instrument is important?

b Define static error? [CO1] [PO1]

c Which of the following flowmeters infer the flow of fluid passing through the flowmeter? [CO2] [PO1]

d	Explain the function of Hook-type Level Indicator?	[CO2] [PO1]
e	What is the difference between mass flow and volumetric flow?	[CO2] [PO2]
f	List the Non-Contact devices used to measure temperature?	[CO3] [PO2]
g	What type of element is The Bourdon tube of a vapour pressure thermometer ?	[CO3] [PO3]
h	Define Time of Flight (ToF) concept?	[CO4] [PO3]
i	Write two different Radiation sources Emission Spectroscopy?	[CO2] [PO3]
j	What are the Components of a Mass Spectrometer	[CO3] [PO2]

PART – C: (Long Answer Questions) 4X15=60 Marks

Answer *ALL* questions

Q.3			
a	Compare Absolute and Relative Measurement?	8+7 Marks	[CO3] [PO2]
b	What are the Functional Elements of an Instrument? Explain with a neat diagram?		[CO2] [PO2]
	OR		
c	What are the Characteristics of Good Performance Measures?	8+7 Marks	[CO2] [PO1]
d	What is the importance of Statistical Analysis in measurement? Explain with an example		[CO3] [PO1]
Q.4			
a	What are the Methods of Liquid Level Measurement? Criticize on float type level indicator	8+7 Marks	[CO2] [PO1]
b	What are the electrical Methods for measuring liquid level? Elaborate on Ultrasonic Level Sensors		[CO4] [PO1]
	OR		
c	What are the methods to measure flow? Explain in detail about Venturi Tube?	8+7 Marks	[CO2] [PO2]
d	What are the different types of flow meters? Explain in detail about Vortex flowmeters?		[CO2] [PO2]
Q.5			
a	Illustrate the methods of Pressure Measurement? Explain the working of Bridge-Based?	8+7 Marks	[CO3] [PO3]
b	Derive the transfer function for Mercury in glass thermometer.		[CO4] [PO3]
	OR		
c	How would you select a pressure gauge for a process? Write the types and purpose of different Bourdon tubes?	8+7 Marks	[CO5] [PO1]
d	Compile the instruments used to measure temperature? Explain in detail about Resistance Temperature Tetector (RTD)?		[CO6] [PO2]
Q.6			
a	Discuss the factors which are affecting the position and intensity of absorption bands in UV-visible spectroscopy?	8+7 Marks	[CO4] [PO3]
b	Explain the principle, construction and working of Absorption Spectroscopy?		[CO3] [PO3]
	OR		
c	Categorize different types of atomizer Emission Spectroscopy?	8+7 Marks	[CO4] [PO2]
d	Summarize the construction and three key stages to the spectrometer?		[CO5] [PO2]

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